A Ficus confused with Proteoides

EDWARD WILBER BERRY

(WITH PLATE 21)

The genus *Proteoides* was founded in 1866 by Heer to include leaves which he considered as belonging to some member of the *Proteaceae*, but which it was not possible to determine more precisely. Since that date this genus has been the receptacle for those more or less lanceolate, somewhat coriaceous leaves with an obscured venation, which are so common during the latter part of the lower and the first part of the upper Cretaceous. The genus undoubtedly includes some forms whose affinities are with the *Proteaceae*, although I venture to advance the opinion that such an affinity on the part of the American leaves usually referred to this genus is very doubtful.

The species with which I am principally concerned, and with which I am most familiar, is *Proteoides daphnogenoides* Heer, described originally from the Dakota group of Nebraska, and since found to be exceedingly plentiful in the Atlantic coastal plain during the Mid-Cretaceous.

I have for a considerable time been of the opinion that this leaf was not Proteaceous, and this opinion seems to have been at least suggested to Newberry in regard to the Raritan leaves, at least what he says implies that while he is sure that his leaves are identical with those of Heer and Lesquereux from the West, he is doubtful if their specimens were correctly identified. Hollick * is more definite, saying of the Staten Island leaves that they are identical with Newberry's Raritan leaves whether the latter are correctly identified or not.

Without considering any arguments based on the distribution of the *Proteaceae* in the living flora we may note that *Proteoides daphnogenoides*, of the coastal plain, while agreeing exactly with Lesquereux's characterization based on the western forms, even to the

* Hollick, Ann. N. Y. Acad. Sci. 11 : 420. 1898.

very prominent midrib, differs from the existing Proteaceae (*Protea*, etc.) in being less coriaceous, and in the character of the venation, which in the latter is somewhat irregular, with the secondaries springing from the midrib at an acute angle and curving outward instead of upward, and showing a further tendency to be massed from the region of the base, which often lacks a petiole.

The leaves of *Proteoides daphnogenoides* on the other hand, more especially those of Newberry, Hollick, and Berry, are generally larger in size, with an extended and narrowly lanceolate apex, petiolate, and with regular camptodrome secondaries.

Heer's type specimens, which are mere fragments, have some long ascending secondaries but Lesquereux's more complete specimens from the same locality are unquestionably identical with the coastal plain specimens, which latter often show the venation characters. The midrib of all the specimens is fairly stout and very prominent, leaving a deep furrow on impressions; the secondaries are very fine and regular and not readily discernible.

With the idea that these leaves might be referable to the genus *Ficus*, I have examined with considerable care the herbarium material of *Ficus* at the Columbia University herbarium and that of the New York Botanical Garden.

I find numerous points of resemblance, and it may be noted that the produced apex of *Proteoides daphnogenoides* is a character common to a number of species of *Ficus*, where it is even more emphasized. A number of different species from such widely separated localities as Central and South America and the Celebes show points of resemblance to the fossil leaf. Especially among the Mexican and Central American species, do we find very similar forms, *e. g.*: *Ficus sapida* Miq., *Ficus ligustrina* Kunth & Bouché, *Ficus lancifolia* Hook. & Arn., and *Ficus fasciculata* Watson, particularly the first, which has much the same outline and consistency, the same prominent midrib, and the same regularly camptodrome venation.

In turning over the herbarium sheets one is strongly impressed with the conviction that in *Proteoides daphnogenoides* we have another and widespread *Ficus* from the Mid-Cretaceous, which flourished along the ancient coasts of the Atlantic continental mass from Long Island, New Jersey, and Maryland around its then

southern border in Alabama, and on the shores across the Mediterranean sea of that period, from Nebraska and Kansas. Lesquereux in 1892 described a large leaf of the same type as a new species of *Ficus* (*i. e.*, *F. proteoides*), thus recognizing its true relations as well as its resemblance to the supposed species of *Proteoides*.

I have not had any opportunity to examine the leaves of this species from Alabama or from the Cheyenne sandstone of Kansas, but as both determinations were by Professor Ward I have no doubt that they are not distinct from the other leaves referred to this species of *Proteoides*.

Placed in the genus *Ficus*, where it seems to me they rightfully belong, these leaves find their affinity in the group which includes, among others, such species as *Ficus elongata* Hosius, *Ficus Berthoudi* Lesq., *Ficus suspecta* Velen., *Ficus Krausiana* Heer, etc.

The accompanying plate will give a good idea of the character of these leaves and includes a nearly complete specimen (FIG. 3) from a new locality (Grove Point, Maryland) recently collected by the writer. It will be noticed that the examples of eastern leaves show the venation much more clearly than do the western specimens.

Following is the synonymy and distribution:

Ficus daphnogenoides (Heer)

Proteoides daphnogenoides Heer, Phyll. Crét. d. Nebr. 17. *pl. 4. f. 9,10.* 1866.— Lesq. Cret. Fl. 85. *pl. 15. f. 1, 2.* 1874; Fl. Dak. Group 90. 1892.— Hollick, Trans. N. Y. Acad. Sci. **11**: 98. *pl. 3. f. 1, 2.* 1892; **12**: 36. *pl. 2. f. 4, 9, 13.* 1893; Bull. Torrey Club **21**: 52. *pl. 177. f. 1.* 1894; Ann. N. Y. Acad. Sci. **11**: 420. *pl. 36. f. 1–3.* 1898. — Smith, Geol. Coastal Plain of Ala. 348. 1894.— Newberry, Fl. Amboy Clays 72. *pl. 17. f. 8, 9; pl. 32. f. 11, 13, 14; pl. 33. f. 3; pl. 41. f. 15.* 1896.— Gould, Am. Journ. Sci. IV. **5**: 175. 1898. — Berry, Bull. N. Y. Bot. Gard. **3**: 74. *pl. 51. f. 6–9.* 1903.

Ficus proteoides Lesq. Fl. Dak. Group 77. *pl. 12. f. 2.* 1892.

Dakota Group: Nebraska and Kansas.

Raritan formation: New Jersey.

Cretaceous: Staten Island, Long Island, Cliffwood, N. J., and Grove Point, Maryland.

Mill Creek series: Mill Creek, British N. W. Territory.

Tuscaloosa formation: Alabama.

Cheyenne sandstone (Comanche series), Chatman Creek, Kansas.

Explanation of plate 21

(Figures two-thirds natural size)

FIGS. 1, 4. After Lesquereaux, 1874.
FIG. 2. After Hollick, 1894.
FIG. 3. From Grove Point, Maryland.
FIG. 5. Lesquereux's type of *Ficus proteoides*.
FIG. 6. From Cliffwood, N. J.
FIG. 9. After Newb. *pl. 17. f. 9.*
FIGS. 13, 14. After Newb. *pl. 32. f. 13, 14.*

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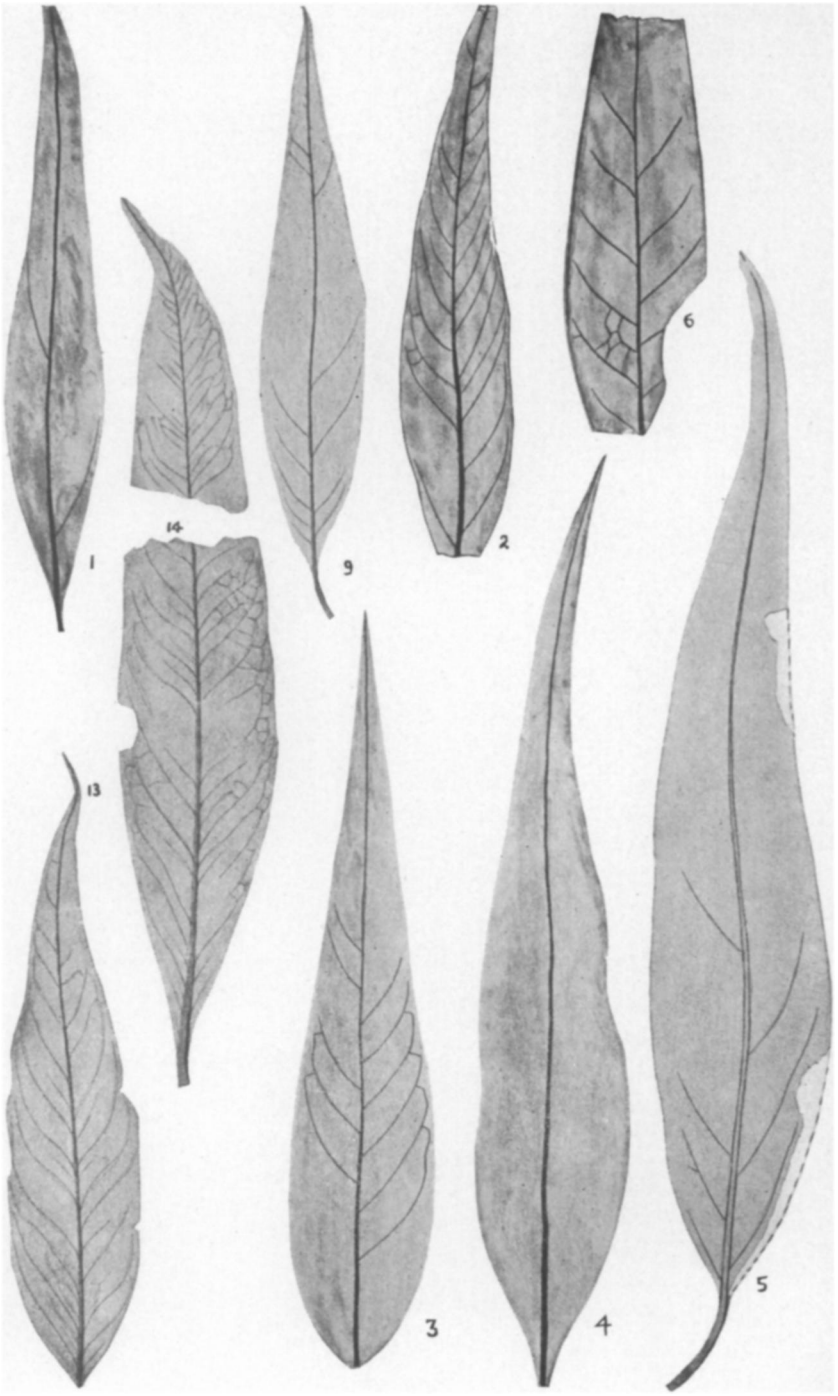

FICUS DAPHNOGENOIDES (HEER) BERRY